

## FINAL CONSONANT CLUSTERS IN ENGLISH AND POLISH

STANISZAW PUPPEL

*Adam Mickiewicz University, Poznań*

### 0. Some introductory remarks

The present paper is an attempt to discuss various consonant combinations (i.e. sequences) permissible in word final position in Standard Present-Day British English and in Standard Present-Day Polish from a purely static point of view. The final consonant clusters will be discussed here in a two-fold way:

- a) they will be characterized in terms of which consonant occupies which position in the sequence;
- b) they will be tabulated and characterized in terms of distinctive features.

The English consonant clusters have already been the subject of many studies (cf. Bloomfield, L. (1933: 131-135); Cygan, J. (1971: 83-98); Fisiak, J. (1968: 3-14); Hill, A. A. (1968: 68-88); Hill, A. A. (1963: 162-172); Hultzen, L. S. (1962: 5-19); Trnka, B. (1966)). They were discussed both from the point of view of permissible co-occurrences of consonant phonemes and from the point of view of distinctive feature sequences. The Polish consonant clusters have also been the subject of some studies (cf. Awedykova, S. (1972: 39-43); Bargieł, M. (1950: 1-24); Kuryłowicz, J. (1952: 54-69); Ułaszyn, H. (1956)). The consonant systems of English and Polish have additionally been presented in two unpublished studies (see Kopczyński, A. (1968: 88-103); Rubach, J. (1971)).

### 1. Traditional phonetic notation and the distinctive feature system

The English and Polish final clusters consist of two, three, and four consonants (throughout the paper they will be referred to as clusters of the -CC, -CCC, and -CCCC type). All the consonants co-occurring in the clusters are rendered by means of traditional phonetic notation. Thus, all English

consonant segments are represented by the following symbols (as used by Halle, M. (1964: 324-333)): /p, b, t, d, k, g, f, v, θ, ð, š, ž, s, z, č, ž, m, n, ŋ, l/. The Polish consonant segments, in turn, are represented by the following symbols (as used by Doroszewski, W. (1963: 70-71), and Wierzbowska, B. (1971: 149-197)): /p, b, t, d, k, g, χ, f, v, s, z, š, ž, ś, ź, c, ʒ, ę, ǰ, ę, ǰ, m, n, ń, l, r, w/. Before going any further on, however, let us make one assumption, namely that each individual symbol of this notation stands for a complex of features<sup>1</sup>, and, consequently, that a sequence of two, three or four consonant symbols stands for a sequence of feature complexes. In our paper we shall further assume that the consonants co-occurring in the final clusters occupy positions -1, -2, -3 and -4, starting from the adjacent vowel on the left to the rightmost position.

## 2. Final clusters in English

2a. The final clusters of the -CC type include the following:

/-pt/	<i>apt</i>	/-vd/	<i>loved</i>
/-kt/	<i>act</i>	/-ðd/	<i>loathed</i>
/-čt/	<i>itched</i>	/-zd/	<i>buzzed</i>
/-ft/	<i>lift</i>	/-ž d/	<i>rouged</i>
/-st/	<i>frothed</i>	/-md/	<i>damned</i>
/-st/	<i>lost</i>	/-nd/	<i>stand</i>
/-št/	<i>furnished</i>	/-ŋd/	<i>belonged</i>
/-mt/	<i>prompt</i>	/-ld/	<i>sold</i>
/-nt/	<i>rent</i>	/-ps/	<i>lips</i>
/-ŋt/	<i>inked</i>	/-ts/	<i>cats</i>
/-lt/	<i>dealt</i>	/-ks/	<i>books</i>
/-bd/	<i>robbed</i>	/-fs/	<i>wife's</i>
/-gd/	<i>bagged</i>	/-θs/	<i>oath's</i>
/-žd/	<i>edged</i>	/-ms/	<i>glimpse</i>
/-ns/	<i>tense</i>	/-lf/	<i>elf</i>
/-ls/	<i>else</i>	/-nθ/	<i>seventh</i>
/-bz/	<i>rub</i>	/-lθ/	<i>health</i>
/-dz/	<i>adds</i>	/-mθ/	<i>warmth</i>
/-gz/	<i>eggs</i>	/-ŋθ/	<i>length</i>
/-vz/	<i>believes</i>	/-dθ/	<i>width</i>
/-ðz/	<i>oath</i>	/-tθ/	<i>eighth</i>
/-mz/	<i>rims</i>	/-pθ/	<i>depth</i>

<sup>1</sup> The system of distinctive features preferred in the paper is that of Noam Chomsky and Morris Halle as proposed in *The sound pattern of English* (1968).

/-nz/	<i>lens</i>	/-fθ/	<i>fifth</i>
/-ŋz/	<i>hangs</i>	/-mb/	<i>rhomb</i>
/-lz/	<i>tells</i>	/-lb/	<i>bulb</i>
/-sp/	<i>lisp</i>	/-nž/	<i>plunge</i>
/-mp/	<i>imp</i>	/-lž/	<i>bulge</i>
/-lp/	<i>help</i>	/-nž/	<i>plunge</i>
/-sk/	<i>ask</i>	/-lž/	<i>bulge</i>
/-ŋk/	<i>think</i>	/-lv/	<i>delve</i>
/-lk/	<i>talc</i>	/-lm/	<i>film</i>
/-nč/	<i>lunch</i>	/-ln/	<i>kiln</i>
/-lč/	<i>belch</i>		
/-nš/	<i>lunch</i>		
/-lš/	<i>welsh</i>		
/-mf/	<i>triumph</i>		

Hultzen also proposes the cluster /-sθ/, as in *isthmian*; the cluster, however, is not included in our list, for it is difficult to establish whether the cluster is a final one or not. This is due to the fact that the word may be divided either into *is+thmian* or *isth+mian*. Thus, the following consonants occupy positions 1 and 2:

Table 1

position 1	position 2
b	b
p	p
t	t
d	d
k	k
g	
f	
v	
θ	θ
ð	
s	s
z	z
š	š
ž	ž
č	č
m	m
n	n
ŋ	
l	

2b. The final clusters of the -CCC type include the following:

/-spt/	<i>gasped</i>	/-lkt/	<i>milked</i>
/-mpt/	<i>pumped</i>	/-nčt/	<i>lunched</i>
/-lpt/	<i>helped</i>	/-lčt/	<i>belched</i>
/-skt/	<i>asked</i>	/-nšt/	<i>lunched</i>
/-ŋkt/	<i>extinct</i>	/-lšt/	<i>welshed</i>
/-mft/	<i>triumphed</i>	/-nts/	<i>ants</i>
/-lft/	<i>delft</i>	/-lts/	<i>halts</i>
/-nst/	<i>against</i>	/-mts/	<i>prompts</i>
/-lst/	<i>pulsed</i>	/-ŋts/	<i>tincts</i>
/mst/	<i>glimpsed</i>	/-pts/	<i>crypts</i>
/-ŋst/	<i>amongst</i>	/-kts/	<i>acts</i>
/-pst/	<i>lapsed</i>	/-fts/	<i>lofts</i>
/-kst/	<i>text</i>	/-mfs/	<i>nymphs</i>
/-tst/	<i>midst</i>	/-lfs/	<i>elf's</i>
/-dst/	<i>midst</i>	/-nθs/	<i>months</i>
/-tθt/	<i>widthed</i>	/-lθs/	<i>healths</i>
/-dθt/	<i>widthed</i>	/-mθs/	<i>warmths</i>
/-nθt/	<i>tenthed</i>	/-ŋθs/	<i>lengths</i>
/-dzd/	<i>adzed</i>	/-dθs/	<i>widths</i>
/-nzd/	<i>cleansed</i>	/-tθs/	<i>eighths</i>
/-nžd/	<i>plunged</i>	/-pθs/	<i>depths</i>
/-lžd/	<i>bulged</i>	/-fθs/	<i>fifths</i>
/-nžd/	<i>plunged</i>	/-mbz/	<i>rhombs</i>
/-lžd/	<i>bulged</i>	/-lbz/	<i>bulbs</i>
/-lbd/	<i>bulbed</i>	/-ndz/	<i>hands</i>
/-lvd/	<i>delved</i>	/-ldz/	<i>holds</i>
/-lmd/	<i>filmed</i>	/-vdz/	<i>bereaved's</i>
/-lnd/	<i>kilned</i>	/-zdz/	<i>accused's</i>
/-sps/	<i>asps</i>	/-lvz/	<i>elves</i>
/-mps/	<i>imps</i>	/-lmz/	<i>films</i>
/-lps/	<i>helps</i>	/-lnz/	<i>kilns</i>
/-sks/	<i>asks</i>		
/-ŋks/	<i>thinks</i>		
/-lks/	<i>elks</i>		
/-sts/	<i>lists</i>		

The following consonants occupy positions 1, 2, and 3:

Table 2

position 1	position 2	position 3
p	p	
t	b	
d	t	t
k	d	d
f	k	
v	f	f
s	v	
z	θ	θ
	s	s
	z	z
	š	
	č	
	ž	
m	m	
n	n	
ŋ		
l		

2c. The final clusters of the -CCCC type include the following:

/ltst/	<i>waltzed</i>	/-ŋkts/	<i>tincts</i>
/-ntst/	<i>chintzed</i>	/-lkts/	<i>mulcts</i>
/-ŋkst/	<i>jinxed</i>	/-ksts/	<i>texts</i>
/-mpst/	<i>glimpsed</i>	/-ksθs/	<i>sixths</i>
/-mpft/	<i>triumphed</i>	/-mpθs/	<i>warmths</i>
/-mpfs/	<i>nymphs</i>	/-ntθs/	<i>thousandths</i>
/-mpts/	<i>prompts</i>	/-ŋkθs/	<i>lengths</i>
		/-lθs/	<i>twelfths</i>

The following consonants occupy positions 1, 2, 3 and 4:

Table 3

position 1	position 2	position 3	position 4
	p		
	t	t	t
k	k	f	
	f	θ	
	s	s	s
m			
n			
ŋ			
l			

Thus, we may now establish the entire inventory of the English consonant segments occurring in the final clusters as follows: /p, b, t, d, k, g, f, v, θ, ð, s, z, ʃ, ʒ, ʧ, ʤ, m, n, ŋ, l/. Below they have been tabulated and characterized in terms of the fully specified distinctive feature matrix.

Table 4

FEATURE	p	b	t	d	k	g	f	v	θ	ð	s	z	ʃ	ʒ	ʧ	ʤ	m	n	ŋ	l	
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-
anterior	+	+	+	+	-	-	+	+	+	+	+	+	+	+	-	-	+	+	+	-	+
coronal	-	-	+	+	-	-	-	+	+	+	+	+	+	+	+	+	-	+	-	-	+
continuant	-	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	+
voice	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	+	+	+	+	+
strident	-	-	-	-	-	+	+	-	-	+	+	+	+	+	+	+	-	-	-	-	-
sonorant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+

### 3. Final clusters in Polish

3a. The final clusters of the -CC type are very numerous in Polish. Awe-dykowa (1972:39) includes within that group also the glide-consonant combinations. Thus, she treats such sequences as /w-C/, as in *chelm*, and /j-C/, as in *wójt*, as final consonant clusters. However, our point of view is that the glides /w/ and /j/ are in this case parts of complex syllable nuclei and as such they are excluded from the group of the two-member clusters. Thus our list of the final -CC type of clusters includes the following:

/-χš/	<i>wichrz</i>	/-rk/	<i>kark, skarg</i>
/-χt/	<i>pacht</i>	/-lχ/	<i>olch</i>
/-rw/	<i>tarł</i>	/-lm/	<i>palm</i>
/-rχ/	<i>parch</i>	/-lf/	<i>golf</i>
/-rl/	<i>rozperl</i>	/-ls/	<i>hals</i>
/-rn/	<i>urn</i>	/-lš/	<i>odwilż</i>
/-rń/	<i>cierń</i>	/-lc/	<i>walc</i>
/-rm/	<i>karm</i>	/-lč/	<i>walcz</i>
/-rf/ <sup>2</sup>	<i>torf, nerw</i>	/-lt/	<i>kult</i>
/-rs/	<i>tors</i>	/-lp/	<i>skalp, kolb</i>
/-rš/	<i>marsz, marż</i>	/-lg/	<i>ulg</i>
/-rś/	<i>piersś</i>	/-lk/	<i>wilk, ulg</i>
/-rg/	<i>skarg</i>		

<sup>2</sup> In word final position all Polish voiced consonant segments are realized phonetically as voiceless consonants.

/-re/	<i>harc</i>	/-nt/	<i>bunt</i>
/-rč/	<i>warcz</i>	/-nk/	<i>tynk</i>
/-ró/	<i>wierć, gardź</i>	/-ńć/	<i>tańcz</i>
/-rt/	<i>tort</i>	/-ńp/	<i>hańb</i>
/-rp/	<i>skarp, torb</i>	/-mn/	<i>hymn</i>
/mf/	<i>triumf</i>	/-ms/	<i>gryms</i>
/-mš/	<i>zamsz</i>	/-śń/	<i>baśń</i>
/-mś/	<i>tlamś</i>	/-śm/	<i>taśm</i>
/-mč/	<i>zniemcz</i>	/-ść/	<i>dość</i>
/-mp/	<i>lamp, bomb</i>	/-čt/	<i>uczł</i>
/-fč/	<i>sprawdź</i>	/-čp/	<i>liczb</i>
/-fr/	<i>cyfr</i>	/-ém/	<i>wiedźm</i>
/-ft/	<i>szyft, prawd</i>	/-ép/	<i>gędźb</i>
/-fl/	<i>treft</i>	/-tl/	<i>namydl</i>
/-sw/	<i>ugryzl</i>	/-dm/	<i>wydm</i>
/-zn/	<i>blizn</i>	/-tw/	<i>plótl, wiódl</i>
/-zm/	<i>spazm</i>	/-tr/	<i>wiatr, kadr</i>
/-sf/	<i>nazw</i>	/-tm/	<i>rytm</i>
/-sp/	<i>izb</i>	/-tf/	<i>modlitw</i>
/-sk/	<i>mózg</i>	/-tš/	<i>patrz</i>
/-sw/	<i>niósl</i>	/-tč/	<i>zaświadc</i>
/-sm/	<i>pasm</i>	/-pr/	<i>Cypr, dóbr</i>
/-sc/	<i>miejsc</i>	/-pń/	<i>wapń</i>
/-st/	<i>post, gwiazd</i>	/-ps/	<i>klops</i>
/-sp/	<i>wysp, izb</i>	/-pš/	<i>pieprz</i>
/-žp/	<i>wrózb</i>	/-pć/	<i>kopć</i>
/-šχ/	<i>wierzch</i>	/-pč/	<i>depcz</i>
/-šč/	<i>wieszcz</i>	/-pt/	<i>adept</i>
/-št/	<i>koszt</i>	/-kw/	<i>siekl, strzygl</i>
/-źń/	<i>bojaźń</i>	/-ks/	<i>kleks</i>
/-śf/	<i>orzeźw</i>	/-kš/	<i>Kiekrz</i>
/-śp/	<i>rzeźb</i>	/-kt/	<i>trakt</i>
/-śl/	<i>myśl</i>	/-kl/	<i>cykl</i>
/-nf/	<i>tynf</i>		
/-ns/	<i>trans</i>		
/-nč/	<i>lincz</i>		

The following consonants occupy positions 1 and 2:

Table 5

position 1	position 2
p	p
t	b
k	t
χ	k
f	χ
s	f
z	s
š	z
ś	š
ź	ś
ć	ź
	ć
	é
	e
m	m
u	
ń	ń
r	r
l	l
	w

3b. The final clusters of the -CCC type include the following:

/-χšt/	<i>wychrzt</i>	/-mst/	<i>pomst</i>
/-χtr/	<i>blichtr</i>	/-mpt/	<i>asumpt</i>
/-rst/	<i>wiorst</i>	/-str/	<i>sióstr</i>
/-ršč/	<i>barszcz</i>	/-stm/	<i>astm</i>
/-ršt//	<i>herszt</i>	/-stš/	<i>ostrz</i>
/-rśc/	<i>garsć</i>	/-ščp/	<i>wieszczb</i>
/-rpw/	<i>ścierpl</i>	/-štr/	<i>musztr</i>
/-lšč/	<i>spolszcz</i>	/-ctf/	<i>wydawnictw</i>
/-ltr/	<i>filtr</i>	/-psk/	<i>Lipsk</i>
/-nšt/	<i>kunszt</i>	/-stf/	<i>zabójstw</i>
/-nks/	<i>sfinks</i>		

The following consonants occupy positions 1, 2, and 3:

Table 6

position 1	position 2	position 3
p	p	t
	t	k
	k	
χ		f
		s
s	s	ś
ś	ś	
		ć
e	é	é
		m
m		
n		r
r		
l		w

3c. The final clusters of the -CCCC type include the following:

/-rstf/	<i>warstw</i>	/-fstf/	<i>marnotractw</i>
/-nctf/	<i>intryganctw</i>	/-pstf/	<i>glupstw</i>
/-ństf/	<i>państw</i>	/-pstš/	<i>zapstrz</i>
/-mstf/	<i>klamstw</i>		

The following consonants occupy positions 1, 2, 3, and 4:

Table 7

position 1	position 2	position 3	position 4
p		t	
f			f
	s		ś
	e		
m			
n			
ń			
r			

Table 8

	p	b	t	d	k	g	x	f	v	s	z	š	ś	ž	ź	č	ć	ǰ	ǰ	ć	ǰ	ǰ	m	n	ń	l	r	w	
FEATURE																													
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
anterior	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
coronal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
continuant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
voice	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
strident	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
sonorant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Thus, the entire inventory of the Polish consonant segments occurring in the final clusters comprises the following :/p, t, k, χ, f, s, z, š, ś, ź, c, ǰ, ć, ǰ, č, m, n, ń, l, r, w/. Below they have been tabulated and characterized by means of the fully specified distinctive feature matrix.

#### 4. The English and Polish final clusters compared

##### 4a. The -CC clusters

The English clusters may either begin with /l, m, n, ŋ/, i.e., the segments specified as  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or with /p, t, d, b, k, g, f, v, θ, ð, s, z, š, ž, č, ǰ, ǰ, č, m, n, ń, l, r, w/. Below they have been tabulated and characterized by means of the fully specified distinctive feature matrix. Position 2 is occupied either by /m, n/, characterized as  $\begin{bmatrix} +\text{consonantal} \\ +\text{nasal} \end{bmatrix}$ , or by /p, b, t, d, k, θ, s, z, š, ž, č, ǰ/, i.e., the segments which may again be characterized as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ .

In the Polish clusters the initial segments may be either /r, l, m, n, ń/, with the features  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or /p, t, k, χ, f, s, z, š, ś, ź, č/, characterized as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 2 is filled either by /m, ń, r, l/, with the features  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , by /w/, specified as  $\begin{bmatrix} -\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or by /p, t, k, χ, f, s, š, ś, ć, č, c/, having the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . We can present the above short comparison by means of the following diagram:

Table 9

	position 1		position 2	
English	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ +\text{nasal} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$
Polish	$\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} -\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$

## 46. The -CCC clusters

The three-member clusters in English may either begin with /l, m, n, ŋ/, i.e., the segments characterized as  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or with /p, t, d, k, f, v, s, z/, having the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 2 allows for the occurrence of either /m, n/, specified as  $\begin{bmatrix} +\text{consonantal} \\ +\text{nasal} \end{bmatrix}$ , or /p, b, t, d, k, f, v, θ, s, z, š, č, ž/, most generally characterized as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 3, in turn, is occupied by /t, d, f, θ, s, z/, with the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ .

The Polish three-member clusters begin either with /m, n, r, l/, which are characterized as  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or with /p, χ, s, š, c/, specified as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 2 is occupied by the following segments: /p, t, k, s, š, ś, č/, they are again characterized as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . And finally, position 3 is filled by /m, r/, with the features  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , by /w/, i.e., the segment characterized as  $\begin{bmatrix} -\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , and also by /p, t, k, f, s, š, č, ć/, with the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . We can again present the above short comparison by means of the following diagram:

Table 10

	position 1	position 2	position 3
English	$\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ +\text{nasal} \end{bmatrix}$ $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$
Polish	$\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ $\begin{bmatrix} -\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$

## 4c. The -CCCC clusters

The four-member clusters in English may either begin with /m, n, ŋ, l/, characterized as  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or with /k/, specified as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 2 is occupied by /p, t, k, f, s/, i.e., the segments with the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . The following occur in position 3: /t, f, s/; they are  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . In position 4 only /t, s/ occur; they are also  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . In the four-member clusters in Polish position 1 is occupied either by /m, n, ŋ, r/, with the features  $\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \end{bmatrix}$ , or by /p, f/, having the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . In position 2 only /s, c/ occur. They are  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . Position 3 is occupied only by /t/, characterized as  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . And finally, position 4 allows for the occurrence of /f, š/. They have the features  $\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$ . We have again presented the above comparison by means of a diagram:

Table 11

	position 1	position 2	position 3	position 4
English	$\begin{bmatrix} +\text{consonantal} \\ +\text{consonantal} \\ +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$
Polish	$\begin{bmatrix} +\text{consonantal} \\ +\text{sonorant} \\ +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$	$\begin{bmatrix} +\text{consonantal} \\ -\text{sonorant} \end{bmatrix}$

5. In the present short contrastive study of the final English and Polish clusters only three distinctive features have been utilized, viz. [consonantal], [sonorant], and [nasal]. They are most general and the study is far from complete. However, it was not the purpose of the paper to discuss some aspects of dynamic phonological processes in English and Polish, but merely to compare in a static way the various co-occurrences of consonant segments in the final clusters.

## REFERENCES

- Awedykowa, S. 1972. *Konfrontative Studien zu phonetisch-phonologischen Strukturen der polnischen und norwegischen Sprache*. Poznań: Adam Mickiewicz University Press.
- Bargieł, M. 1950. "Grupy fonemów spółgłoskowych współczesnej polszczyzny kulturalnej" *BPTJ* 10.
- Bloomfield, L. 1933. *Language*. New York: Henry Holt.
- Chomsky, N. and M. Halle. 1968. *The sound pattern of English*. New York: Harper and Row.
- Cygan, J. 1971. *Aspects of English syllable structure*. Wrocław: Wrocławskie Towarzystwo Naukowe.
- Doroszewski, W. 1963. *Podstawy gramatyki polskiej. I*. Warszawa: PWN.
- Fisiak, J. 1968. "Prevocalic consonant clusters in the history of English". *SAP* 1. 3-14.
- Fodor, J. and J. J. Katz. (eds). 1964. *The structure of language*. Englewood Cliffs, N. J.: Prentice-Hall.
- Halle, M. 1964. "On the bases of phonology". In Fodor, J. and J. J. Katz. (eds). 1964. 324-334.
- Hill, A. A. 1958. *Introduction to linguistic structures*. New York: Harcourt, Brace and World.
- Hill, A. A. 1963. "Final clusters in English". *English language teaching* 17/4. 167-172.
- Hultzen, L. S. 1962. "Consonant clusters in English". *American speech* 40/1. 5-19.
- Kopezyński, A. 1968. *The Polish and English consonant phonemes*. Unpublished Ph. D. dissertation. Poznań: Adam Mickiewicz University.
- Kuryłowicz, J. 1952. "Uwagi o polskich grupach spółgłoskowych". *BPTJ* 9. 54-69.
- Rubach, J. 1971. *Consonant clusters in English and Polish*. Unpublished M. A. thesis. University of Warsaw.
- Trnka, B. 1966. *A phonological analysis of present-day standard British English*. Rev. ed. Tokyo.
- Ułaszyn, H. 1956. "Ze studiów nad grupami spółgłoskowymi w języku polskim". *Prace językoznawcze PAN* 8. Wrocław.
- Wierzchowska, B. 1971. *Wymowa polska*. Warszawa: PZWS.